SNAKE-EELS OF THE GENUS *XYRIAS* (ANGUILLIFORMES: OPHICHTHIDAE)

by

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ABSTRACT. - The rare and heretofore monotypic snake-eel genus *Xyrias* (Jordan & Snyder, 1901) is expanded to include *X. revulsus* Jordan & Snyder (1901), *Ophichthus multiserialis* Norman (1939) and *Ophisurus guineensis* Blache (1975). A key to the species, and diagnoses and distributional data are provided, including the first records of *X. multiserialis* from Somalia and *X. revulsus* from the Philippines and South Africa.

RÉSUMÉ. - Le genre *Xyrias* (Anguilliformes: Ophichthidae).

Le genre *Xyrias* (Jordan & Snyder, 1901), rare et jadis monotypique, est étendu afin d'y inclure *X. revulsus* Jordan & Snyder (1901), *Ophichthus multiserialis* Norman (1939) et *Ophisurus guineensis* Blache (1975). Une clé des espèces et les diagnoses sont présentées, ainsi que les données sur leur distribution. *X. multiserialis* est signalée pour la première fois en Somalie et *X. revulsus* aux Philippines et en Afrique du Sud.

Key-words. - Ophichthidae, *Xyrias*, *X. revulsus*, *Ophisurus guineensis*, *Ophichthus multiserialis*, Taxonomy, New distributions.

The fearsome-appearing snake eel *Xyrias revulsus* Jordan & Snyder (1901) has received scant notice since its description. Known only from the holotype and a few subsequent specimens in the Sea of Japan and off China (Glover, 1973; Tan, 1983), *Xyrias* has remained monotypic and obscure. The capture of *X. revulsus* specimens from far distant locales caused me to examine type specimens of other poorly known ophichthids, resulting in the inclusion of two other related species into *Xyrias* and an expansion of the characterization of the genus.

MATERIALS AND METHODS

Measurements are straight-line, made either with a 300 mm ruler with 0.5 mm gradations (for total length, trunk length, and tail length) and recorded to the nearest 0.5 mm, or with dial calipers (all other measurements) and recorded to the nearest 0.1 mm. Body length comprises head and trunk lengths. Head length is measured from the snout tip to the posterodorsal margin of the gill opening; trunk length is taken from the end of the head to mid-anus; maximum body depth does not include the median fins. Gill arches were removed, cleared and counterstained with alcian blue and alizarin red dyes (Dingerkus and Uhler, 1977). Vertebral counts (which include the hypural) are taken from radiographs. The mean vertebral formula (MVF) is expressed as the average of predorsal,

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Cybium 1998, 22(1): 7-13.

preanal, and total vertebrae (Böhlke, 1982). Institutional abbreviations follow the Standard Symbolic Codes for Institutional Research Collections in Herpetology and Ichthyology (Leviton *et al.*, 1985).

XYRIAS JORDAN & SNYDER, 1901

Xyrias Jordan & Snyder 1901: 868 (type species *Xyrias revulsus* Jordan & Snyder 1901, by original designation and by monotypy).

Diagnosis

Ophichthid eels, subfamily Ophichthinae, tribe Ophichthini (*sensu* McCosker, 1977), with the following unique combination of characteristics: jaws elongate; dorsal fin above or slightly behind pectoral fin tips; postorbital strut absent; two preopercular pores; teeth strong, conical, not extremely enlarged, those of vomer largest, uniserial and widely spaced; anterior intermaxillary teeth exposed before lower jaw tip, lower jaw teeth uniserial, those of upper jaw with an outer uniserial row, flanked by a large inner multiserial patch which broadens posteriorly.

Description

Those characters described above, as well as: body cylindrical, moderately elongate, tail either slightly shorter or longer than head and trunk; tail tip hard, pointed; snout short, subconical; jaws elongate, the lower inferior; eye small to moderate; anterior nostril in upper lip in a short tube and laterally directed, ovate, with a minute flap; posterior nostril in upper lip and covered by a flap; gill opening oblique, crescentic, longer than isthmus; gill arches typically ophichthine, fifth ceratobranchial ossified, upper pharyngeal tooth plates united by a suture; coloration yellow to tan with numerous small to medium brown spots on head, chin, and dorsum. (A further description of the gill arches, hyoid apparatus, pectoral girdle, and other osteological characters of *X. revulsus* is provided in McCosker [1977: 84]).

Remarks

The nearly uniform condition of their coloration and their dentition are striking features of the species of *Xyrias*. They occupy similar depths and presumably similar bottom types, and probably behave as large, lie-and-wait predators over sand bottoms. Within *Xyrias* several synapomorphies are obvious, particularly the abundance and distribution of the dentition. The elongation of the trunk region is a synapomorphy shared by *X. revulsus* and *X. multiserialis*. The shortening of the snout is an autapomorphy of *X. revulsus* and probably related to the location of its head at the opening of a burrow, a feeding and morphological adaptation shared by other ophichthids including the species of *Brachysomophis* and *Echiophis* (McCosker, 1977; McCosker *et al.*, 1989).

The species of *Xyrias* are unique within the tribe Ophichthini in a number of characters, particularly those related to the snout configuration and dentition. In general appearance, they are similar to the long-jawed New World species of *Echiophis* and *Scytalichthys*, from which they differ in their dentition.

The postorbital strut, resulting from the fusion of the three postorbitals and providing a brace between the maxilla and the neurocranium, is obvious in species of *Ophichthus, Ophisurus, Echiophis* and *Mystriophis* and extreme in those of *Brachyso-*

mophis, but absent in those of *Xyrias*, probably secondarily lost. *Xyrias* shares some of its specialized snout shape and dentition with species of *Ophisurus*, however the dental arrangement of *Xyrias* is considerably more specialized and it has lost the third preopercular pore.

Key to the species of *Xyrias*

1a. Head and trunk longer than tail; snout length more than twice in upper jaw; pectoral fin 6.2-6.5 in head length (HL); center of eye above or before middle of upper jaw; vertebrae 140-160 .... **2**

1b. Head and trunk shorter than tail; snout longer, about twice in upper jaw; pectoral fin longer, 3.6-6.1 in HL; center of eye behind middle of upper jaw; vertebrae 194-199 (*off Congo*) .... *X. guineensis*

2a. (1a). Head 7.2-7.8 in total length (TL); pectoral fin 3.6-4.3 in HL; middle of orbit above middle of upper jaw; vertebrae 140-141 (*Gulf of Aden, off Somalia*) .... *X. multiserialis*

2b. (1a). Head 9.1-9.6 in TL; pectoral fin 5.3-6.1 in HL; snout shorter, rear margin of orbit above middle of upper jaw; vertebrae 155-160 (*Indo-Pacific, from Japan to South Africa*) .... *X. revulsus*

XYRIAS GUINEENSIS (BLACHE, 1975)

Figs 1b, 2b

Ophisurus guineensis Blache, 1975: 727, figs. 7-8 (Pointe-Noire, holotype MNHN 1974-186).

Diagnosis

Body depth 43-50, head 10.8-11, and tail 1.8-1.9 in TL (total length). Pectoral fin short, 6.2-6.5 in head. Dorsal fin arises 1/2 pectoral fin length behind pectoral fin tips. Snout long, about twice in upper jaw length. Eye about 2.5 in snout length, anterior margin of orbit above middle of upper jaw. Total vertebrae 194-199 (n = 2).

Distribution

Known only from the holotype and paratype, captured in 300 m off Pointe-Noire, Congo.

Remarks

As illustrated in its description (Blache, 1975: fig. 8), the holotype of *guineensis* appears to have a very narrow snout, particularly ahead of the anterior nostril. I am convinced, after examining the type specimens, that it is an artifact of the preservation of the holotype, in that the snout of the paratype is not so constricted.

Material examined

Holotype. - MNHN 1974-186, 636 mm, Pointe-Noire, Congo, from 300 m by J. Blache on 17 Apr. 1973.

Paratype. - MNHN 1974-187, 604 mm, captured with the holotype.

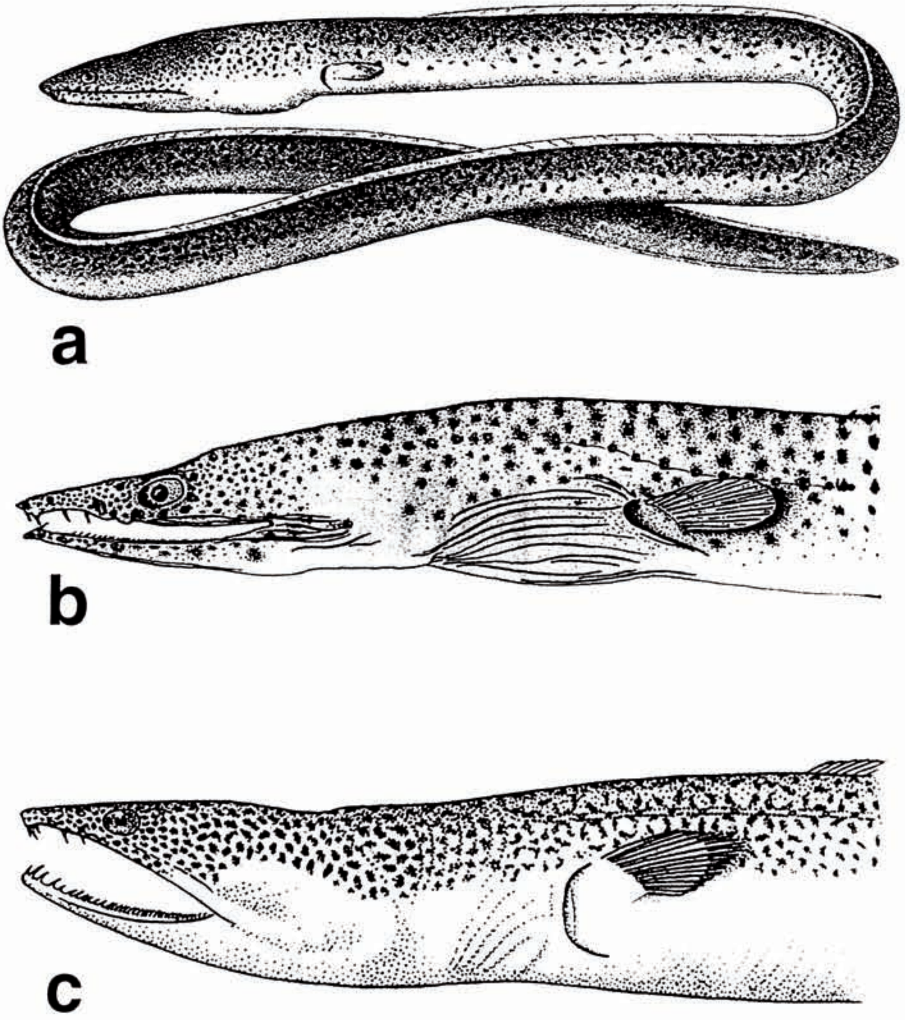

Fig. 1. - Holotypes of the species of *Xyrias*. Top. *X. revulsus* (after Jordan and Snyder, 1901: fig. 16). Center. *X. guineensis* (after Blache, 1975: fig. 7). Bottom. *X. multiserialis* (after Norman, 1939: fig. 15).

XYRIAS MULTISERIALIS (NORMAN, 1939)

Figs 1c, 2c

Ophichthus multiserialis Norman, 1939: 42, fig. 15 (Gulf of Aden, holotype BMNH 1939.5.24.649).

Diagnosis

Body depth 16-19, head 7.2-7.8, and tail 2.2 in TL. Pectoral fin longer, 3.6-4.3 in head. Dorsal fin origin variable, arising between a pectoral fin length behind to just

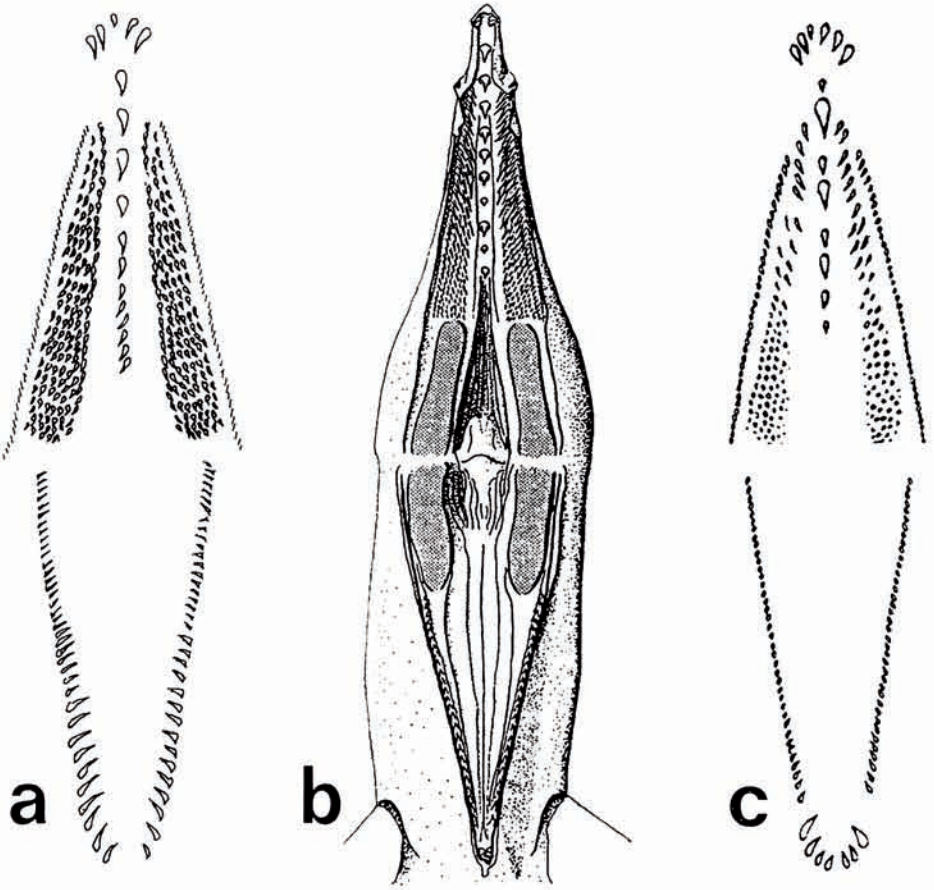

Fig. 2. - Dentition of the holotypes of the species of *Xyrias*. a. *X. revulsus*, CAS-SU 6476. b. *X. guineensis*, MNHN 1974-186 (after Blache, 1975: fig. 8). c. *X. multiserialis*, BMNH 1939.5.24.649 (after Norman, 1939: fig. 15).

above pectoral fin tips. Snout moderate, 2.3-2.9 in upper jaw length. Eye 1.9-2.5 in snout length, center of orbit directly above middle of upper jaw. MVF 16.7-67.3-140.3; total vertebrae 140-141 (n = 3).

Distribution

Known from the Gulf of Aden and off Somalia, captured between 220-322 m.

Remarks

Randall's (1995: 63) mention of a 152 mm juvenile collected in 11 m off southern Oman is based on a juvenile specimen of *Ophisurus serpens*.

Material examined

Holotype. - BMNH 1939.5.24.649, 649 mm, female, Gulf of Aden.

Other material examined. - USNM 344459, 752 mm, female, Somalia, Ras Binnah, 11°05'30"N, 51°26'48"E, SOSC Field no. GJS 114, Sta. 9, bottom trawled in 305-322 m by G. Small, 6 Feb. 1987; CAS 91859, 714 mm, female, collected with USNM 344459.

XYRIAS REVULSUS JORDAN & SNYDER, 1901

Figs 1a, 2a

Xyrias revulsus Jordan & Snyder, 1901: 869, fig. 16 (Misaki, Japan, holotype CAS-SU 6476).

Diagnosis

Body depth 36-43, head 9.1-9.6, and tail 2.1-2.2 in TL. Pectoral fin 5.3-6.1 in head. Dorsal fin arises a pectoral fin length behind pectoral fin tips. Snout short, 2.7-3.4 in upper jaw length. Eye small, 2.0-2.8 in snout length, rear margin or orbit above middle of upper jaw. MVF 17.3-77.7-157; total vertebrae 155-160 (n = 3).

Distribution

From Japan to South Africa, including specimens from the Philippines and the China Sea, trawled between depths of 146-209 m.

Remarks

X. revulsus was known for many years only from the holotype until Glover (1973) reported that it was caught occasionally by shrimp trawlers in the Misaki, Kochi, and Kumano prefectures of Japan. Masuda *et al.* (1984: pl. 33 L) reported it from Kanagawa Prefecture to Nagasaki Prefecture, Japan, and included a color photograph of an adult specimen. Tan (1983) recorded a specimen from the China Sea, captured southeast of Tiaoyu Island (25°45'N, 124°00'E).

Material examined

Holotype. - CAS-SU 6476, 880 mm, female, from the Asakusa Aquarium, Misaki, Japan.

Other material examined. - NMV A 11608, 644 mm, female, Philippines, S. of Bohol, 09°30.4'N, 122°50.5'E, otter trawled in 146 m by C.C. Lu on 22 Nov. 1979. SAM 31572, 1128 mm, female, South Africa, Natal, 27°00.0'S, 32°56.8'E, trawled in 209 m, 10 Aug. 1988.

Acknowledgements. - Many individuals have assisted me in the course of this study. I thank the curators and collection managers of: the British Museum (Natural History) (BMNH); the Bernice P. Bishop Museum (BPBM); the California Academy of Sciences (CAS); the Muséum National d'Histoire Naturelle (MNHN); the National Museum of Victoria (NMV); the South African Museum (SAM); and the U. S. National Museum of Natural History (USNM). I also thank: Leslie Knapp of the Smithsonian Oceanographic Sorting Center; Pearl Sonoda and Mysi Hoang of CAS for assistance with translations; Roy Eisenhardt for photographic assistance; and Richard Rosenblatt for reading this manuscript.

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Reçu le 02.04.1997.
Accepté pour publication le 11.09.1997.